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PHOTOGRAPHIC ENLARGER.
EDITED BY J. HAY TAYLOR.

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CONTENTS.

PAGE
Notes... 177
New Form of Incandescent Light for the Lantern ... 178
Explosion at a Lantern Entertainment 178
Ether Saturators and Other Matters 179
Colouring Lantern Slides—No. 6 179
Our Visits—No. 2 180
Compressed Gas Cylinder Fittings 181
How I Became a Lanternist—No. 9... 182
PAGE
Mr. J. Traill Taylor's Form of Triple Condenser and Fittings 183
"Notes" on "Queries" ... 184
The Eth-oxo Light... 184
Stereoscopic Effects with the Lantern 185
Hints and Helps—No. 4 ... 186
Editorial Table 186
Correspondence—
Re Click in Beard's Regulator 187
Lantern Microscope 187
Rolling Curtain Shutter ... 187
Notes and Queries... 188

Notices.

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Notes.

WITH the present issue we end our second volume, which includes, from June 1, 1890 (nineteen months). We have continued Vol. II. until this month, in order that in future each volume may begin with the New Year.

* * *

WALTER GRIFFITHS AND CO. (LIMITED) have made arrangements with the Fry Manufacturing Company, whereby the latter will act as London agents for their Guinea Hand Camera, a large stock of which will be found at their show-rooms in Chandos Street.

* * *

A BINOCULAR lanternscope, on the principle we advocated on page 72 of the present volume, is to be placed upon the market by Messrs. J. F. Shew and Co., of Newman Street, W.

* * *

THE National Sunday League are holding a series of instructing and amusing lectures throughout London on Sunday evenings. On the 15th ult., Mr. T C. Hepworth gave a lecture, at Middelton Hall, N., on "Marvels of Modern Photography," with lantern illustrations. A very large audience was present, and great interest is taken in these Sunday evenings. Full particulars of this movement may be obtained from Mr. H. Mills (Secretary), 221, High Holborn, W.C.

* * *

THE recent gas-bag explosion at Ilkeston is, without doubt, the greatest calamity that has occurred in connection with the use of the lantern.

* * *

WITH our next volume we hope to commence a series of articles, containing advice and practical instructions intended for the inexperienced.

* * *

DURING the next few days we intend trying the new single lantern dissolver, introduced by Messrs. Archer and Sons, of Liverpool, and will give a description of it in our next.

* * *

WE wish all our friends and readers "A MERRY CHRISTMAS."

New Form of Incandescent Light for the Lantern.

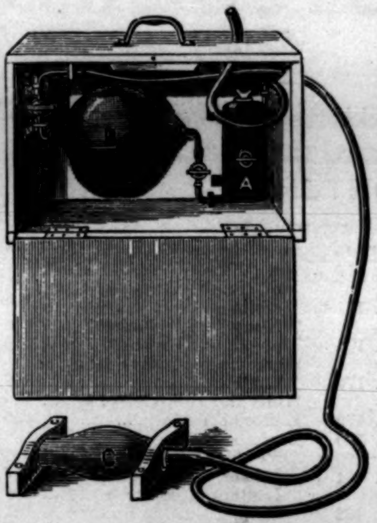
THE Welsbach system of incandescent lighting has, by a modification, been made applicable to optical lanterns. In the ordinary domestic form of burner the candle power ranges about twenty-five, this being at the ordinary pressure of gas obtained from the house mains. By increased pressure the intensity of the light is greatly added to and it is this feature which has been found to make it applicable as an illuminant for optical lanterns. A mantle or cone which is rendered incandescent surrounds the top of the burner, and is made as follows: German cotton is knitted in the form of a cylinder by an ordinary "stocking knitting machine," after which it is well washed in from twelve to fifteen changes of water, acids, &c., in order to ensure its being quite free from greasiness or other impurities. It is then thoroughly dried. The cotton tubing is now impregnated with metallic oxide—presumably Lanthanum or Zirconium—and allowed to dry in a uniform temperature of 110° Fahr. It is then cut into lengths of a few inches and one end of each length drawn together or closed.

Next it is necessary to destroy the cotton and leave only a skeleton of metallic oxide, this is quickly effected by suspending the mantle and playing upon the upper part with a bunsen burner for a few minutes, when the cotton will slowly be consumed with a yellow flame. The cotton once having begun to ignite, burns slowly downwards without further application of the bunsen flame. In a few minutes this is complete.

Whilst the cone is hot it is shaped by the manipulation of a couple of metallic rods. It is then requisite to "season" it by placing it above a bunsen burner for several hours, it is now extremely fragile, but is strengthened by dipping in a solution of collodion and india-rubber, which renders it of sufficient toughness to be sent in a small box through the post if desired.

For lantern work a bunsen burner surmounted by a mantle is placed inside of the lantern, no glass chimney being required, as is the case when this form of light is employed for domestic purposes, but as the intensity of the light depends upon the pressure of the gas, it is necessary to use a forcer, but as the quantity thus used is very great, The Incandescent Gas Light Company, of 14, Palmer-street, Westminster, have devised a method by which common air is employed instead of gas, for which purpose they supply a blower, or air generator, a carburretter and an air bag.

The pump or air generator is in the form of an elongated ball C. of stout vulcanised rubber and is provided with a valve at either end; this is placed upon the floor, and air is pumped into the air bag B. which is also made of stout rubber. After passing through the carburretter A., which contains benzoline, it becomes a luminous gas which can be burned in the bunsen burner at the part where the mantle is placed. With good pressure the light is exceedingly brilliant at a cost, we are informed, of less than a penny an hour. The mantle requires to be replaced after burning about two hundred hours.



Instead of the foot blower mentioned, compressed air in cylinders can be used, or an ordinary gas bag charged with air and placed between pressure boards will answer for a time.

It might be interesting to try the effect of introducing a small stream of oxygen into the centre of the mantle whilst in the incandescent state, but this we did not have facilities for doing at the time when we tried this form of illuminant.

—:o:—

Explosion at a Lantern Entertainment.

A SAD calamity occurred at Ilkeston, on the 18th ult. Councillor Jos. Scattergood had arranged to give a lantern entertainment, in order to wipe off a debt of the Pleasant Sunday Afternoons Association, and a large audience had assembled at the Methodist Church to witness "Little Nell." Immediately upon the oxygen being turned on, a sharp crack, not unlike a pistol-shot, occurred, and this was immediately followed by a tremendous explosion, which caused sad havoc. All the windows of the church, except one, were blown out, a young man almost instantly killed, and several people injured.

The large windows in the front of the building were composed of small squares of glass and lead frames, and although they were not blown out, they were twisted out of shape. The inside appeared in a very sad condition, chairs were strewed about the place, and glass, which had fallen inwards from the broken windows, was distributed all over the floor. The roof has not escaped, for large pieces of plaster were dislodged, and the gas-brackets and roof-beams contain particles of a coloured table-cloth that covered the box upon which the lantern stood. Three iron half-hundredweights were thrown into the air, and alighting on the ground, smashed a hole in the flooring.

Mr. Scattergood is an experienced lanternist of many years' standing, and on all occasions exercised the greatest possible care; he used gas-bags.

Various theories for the accident have been suggested, amongst them being—that the weights may have slipped off the bags, causing back-pressure; the burner may have been partly choked. The true cause can only be looked for in the admixture of the gases, and that when, re-filling the gas-bags, which having been used on the previous evening, were not absolutely empty. The oxygen may have by mistake been put into the bag which had previously contained hydrogen, or the hydrogen into that for the oxygen. We have received a letter from Mrs. Scattergood, who states that her "husband is completely prostrated with the shock and bruises, although not seriously wounded; but the trouble is great upon us. Perhaps later on he will write you. I escaped actual injury, but suffer."

Ether Saturators and Other Matters.

By C. Goodwin Norton.

DOUBTLESS many readers think that the ether question has been thoroughly threshed out; but as some lanternists are still of the opinion that ethoxygen is perfectly safe if proper care be taken, the following incident may prove useful.

A week or two ago I called upon one of the leading lantern houses in the Midlands. On the counter was exhibited a lantern outfit, an ether saturator being employed in place of hydrogen, and inquired from the salesman whether he considered it quite safe, and he informed me that he had used that identical apparatus on numerous occasions without a single hitch. Upon his assuring me that he thoroughly understood the subject, he invited me to see its working.

After making all the necessary connections, the lantern—which was a bi-unial—was lighted up, the light produced being all that could be desired. All went well for a few minutes, when, without any warning, a tremendous explosion occurred; both tubes were blown off, and a large flame came out of the saturator. Fortunately no damage was done; but had this occurred at an exhibition to which the public were admitted, it would be difficult to say what damage might have been done, as most assuredly it would have caused a panic, and, to say the least, it would have been most inconvenient.

I have been much interested in the discussion which has, for some months past, been going on in these pages on the subject of ether saturators; and had I been thoroughly convinced of their absolute safety would have adopted this method as being more convenient, especially when one is travelling; but from what I have seen, heard, and read about the subject, I fail to see my way clear to adopt it, especially as many of my audiences are composed, in a great measure, of children.

I have lately been giving a series of shows to children, in connection with Mr. Brogden's Swiss Choir, which is well known in the North of England, and have had large audiences, as many as three thousand being in the hall at one time, and with such responsibility resting upon one it is a duty to employ only such apparatus as may be depended upon. I use mixed jets and limes of my own manufacture (a few of which I send to the Editor with this communication), and have both cylinders fitted with "Reliable" regulators, a form I was lately recommended to try. Thus one or two lights can be turned up or down as rapidly as possible, as in flashing the flame in the well-known subject of the "House on Fire," without in the least affecting the remainder.

The entertainments spoken of have been given during the daytime, and in a very large hall, the walls of which were plentifully supplied with long windows; and it was no small matter to effectually block out all the light; and as the disc was 20ft. in diameter at a long range it was essential that they were well blocked up. This I did by pasting two thicknesses of brown paper over them.

In view of the many accidents which have from time happened with gauges, by reason of the gas being suddenly allowed to enter the small tube, which has no outlet, I have on this score adopted what I find to be the safest style, known as the "pocket gauge." It is small, accurate, and last, but not least, it can be used indiscriminately for ascertaining the quantity of oxygen and hydrogen in the gas cylinders.

I am of opinion that now regulars, gauges, and such fittings can be obtained at small cost, these, combined with a little discrimination on the part of the lanternist, should have the effect of accidents at lantern entertainments being spoken of as a thing of the past.

[We have tried the limes spoken of, and find them excellent.—Ed.]

Colouring Lantern Slides.—No. 6.

By A. W. Scott.

(Continued from page 170.)

Moonlight Scenes are frequently very effective. If the photograph has been taken against the sun, so that the cast shadows incline towards the spectator, the moon may be included in the picture; but when there are conspicuous shadows inclining to the right or left, it will be better to omit the moon, and to put in a few clouds or stars instead. There are many pretty moonlight slides in existence in which the shadows are evidently not cast by the moon; or if they are, they do not fall on the side opposite the light. Such phenomena are doubtless interesting; but not being met with in Nature, it is, perhaps, wise to avoid them in our pictures. In the case of photographs taken in diffused light, we may put the moon anywhere, and paint in the cast shadows by hand in the proper positions.

A moonlight sky may be represented in various ways. Just after sunset, the sky is frequently of a rich blue colour, which may be imitated by a deep tint of pure Prussian blue. This rich colour does not last very long; it quickly becomes darker in tone, until it changes to the sombre indigo of night, which may be represented by a mixture of Prussian blue and ivory-black; or if a greenish tint be desired, by a mixture of blue with burnt umber. It may be observed that the sky blue of day is a purple or ultramarine blue; but the sky blue of night is a greenish blue.

An effective sky is that of a late sunset, when the sun is well below the horizon, leaving a glow of light with a few bright streaks of cloud of an orange colour on the horizon, the rest of the sky being of a darker and bluer tint. If the glow is on one side of a picture, the portion of the sky farthest from it will be the darkest, and here a crescent moon may be put; this owes its light to the sun, and, therefore, the rounded side will face the light, the horns being turned upwards and away from the sun. The crescent should be thin, as such a sky is only seen when the moon is nearly "new" A full moon at sunset is always a long way from the place where the sun sets; so that it could not well be included in the same picture.

When two lanterns are used, we can secure a more realistic moonlight effect by painting the view as a daylight or twilight scene; and then, with a duplicate photograph, painting a sky with an intense blue, and clouds with opaque black; also covering with black all the rest of the picture, except where high lights are. At night, for example, the windows of houses, and perhaps a doorway or two, church-clocks lights in street lamps, and the like, not omitting the moon and stars, if there is much sky-space. After this, the slide can be dried; then an etching-needle may sometimes be used. This is a dangerous tool, and should be applied with extreme care, so that the etched lines are made extremely fine, and free from torn edges. The high lights may be tinted with suitable colours—a very pale yellow for the moon, and deeper yellow and orange tints for the windows, &c.

When exhibited in the lantern, the day view is shown first on the screen with full brilliance; a pale orange or red glass is slowly pushed over the front lens, to give a sunset effect, next a piece of pale blue glass follows the red, so that the picture becomes blue; then a bit of perforated zinc is slowly passed over the blue glass, to reduce the light. The second lantern is now ready with a plate of tin behind or in front of the slide, to temporarily cut off the light from the screen. On slowly withdrawing this plate, the windows of the houses, &c., will appear to light up one after another. Such an effect requires two or three minutes to show properly, and the lecturer should not be in too great a hurry for the next picture, otherwise some of the romance of the scene will disappear.

——:o:——

Our Visits.

No. 2.—WALTER TYLER.

MR. TYLER is certainly a man of great enterprise. Several years ago he opened a small shop in Waterloo Road, in which he dealt in second-hand lantern apparatus. Here—by small profits and quick returns—he increased his business to such an extent that an enlargement of premises became necessary; but, as more room could not be obtained, the lease of 48, Waterloo Road, was purchased; and about a year ago it became necessary to have still larger premises, and then the lease of No. 50 was obtained, in addition to 48. To these two buildings we recently paid a visit. The ground floor is occupied as two large shops, both elegantly fitted up, one of which is devoted exclusively to lantern apparatus, whilst the stock in the other is to an extent photographic.

Upon asking for Mr. Tyler, an assistant communicated with him by a speaking-tube, as he was in another part of the building; and in due time we were shown over the premises, commencing with the basements, which are used for storage and packing.

The first floor is, perhaps, the most interesting, as it contains a slide library, clerk's office, postal order room, and a private office for Mr. Tyler and his manager.

Many pleasant hours could be spent in the slide library, the four walls of which are closely lined with boxes containing slides, each box, which holds from eighty to one hundred slides, being placed so that the label on the end can be readily seen. Upon inquiring as to the method of finding any particular slide, we were referred to the young lady in charge, who asked the name of any set we wished to find. This having been mentioned, an alphabetical index was referred to, and opposite the name was the number of the box in which it was to be found. It is the custom when a set of slides is removed from any particular box for an order number to be deposited in its place. Several customers were here seated at a large central table looking over and selecting sets suitable for the occasions for which they were required.

We passed through the general office, but found nothing of interest save cash-books, ledgers, and other books, doubtless not without interest to the proprietor. On the next floor we come to the stock room, which certainly is what its name implies. It is a rather difficult thing to describe the various apparatus to be seen here; but certainly a particular form of lantern termed "Helioscopic" was well represented. From this department an elevator communicates with each floor. In close proximity we find a room in which the slides are made up and packed; also a room in which the slides are made, and entering immediately out of this is a dark room. After ascending another stair we come to a large studio, which is principally used for enlarging purposes.

In addition to selling the apparatus, a very large business is done in hiring out lanterns and slides. and this we may say is one of the special features of the firm.

As Mr. Tyler has telephonic communication in his office, many orders come through this source, not only from various parts of London, but other towns as well. Whilst we were in the building, a communication was received direct from Brighton.

A number of new gas cylinders without fittings were being delivered at the time of our visit; these we were informed would not only be finished in the course of a few days, but (as Mr. Tyler proudly said) tested, filled, and in the hands of purchasers also.

As a means of telling at a glance, which cylinders are the property of the firm and which belong to customers (and are sent in for re-charging only), the former have a bright green band painted round them as a distinguishing mark.

A new catalogue is shortly to be brought out which it is stated will be even larger than the last.

Compressed Gas Cylinder Fittings.

By R. R. Beard.

As compressed gas is now used by the majority of lanternists, a few notes upon the different cylinder fittings and joints will not be out of place.

Several years have now passed since gas was first used in a compressed state for limelight and other purposes, but not until recently has the size of the fittings of cylinders been such that they could be relied upon.

The firm of Orchard was the first to condense gas commercially, but the pressure was only 600lb., or forty atmospheres, and the retail price twice that of the present time, but very few employed it.

A few years ago a second firm (Clarkson) commenced condensing gases, and by degrees it became to be more generally used. Clarkson's cylinder fittings were very similar to Orchard's, but the former made an error in introducing them a trifle larger in diameter than Orchard's, which was a male thread with twenty threads per inch, or a quarter-of-an-inch bolt (Whitworth's thread). This difference, however, at that time was of little importance; but, with the introduction of regulators, matters were a little difficult, as, with the use of these, the whole of the pressure in the cylinder came upon the joint and also the valve-screw. The valve-screw was easily rectified; a wax was well worked in with the threads of the valve, which proved to be effectual inasmuch as it could be fairly relied upon, and the introduction of the stuffing-box perfected the valve arrangement.

The outlet fitting, however, still remained, each compresser keeping to his original size—Orchard's small and Clarkson's large. This was very awkward for those who purchased a regulator and only hired the cylinders, he not knowing that there were cylinders with two different fittings on the market; the regulator was perhaps made with small-size fittings and the cylinder hired provided with large, or the reverse—a large-fitting regulator and small-fitting cylinder, and, more often than not, this was not discovered until just before it was required for use. If a large-fitting regulator were screwed on to a small-fitting cylinder, the threads from both would be stripped off from both regulator and cylinder.

However, after a time, users began to get somewhat used to this kind of performance, and, when hiring a cylinder, would say that their regulator was large or small as the case might be. But matters were doomed to become still more complicated by reason of the many different connections made to suit the different cylinders.

Brin's process next came forward, and with it a very ingenious fitting, invented by Mr. Brier, who was at that time manager to the company. The valve itself was of the same form as before—known as hydraulic valve; but it differed in the outlet, which was a half-an-inch male, iron barrel size, with a female cone, the connection being made by a differential threaded coupling upon a screwed nipple, with a conoid end seating itself into the cone. This valve is usually fitted to cylinders by the manufacturers. This half-inch male thread has its faults, for, should it get knocked or bruised, the coupling will not go on, or the cone will not make a sound joint. To obviate the chances of getting bruised, an iron cap is screwed upon it and sometimes chained to the cylinder, to prevent its becoming lost; but, if chained, it was generally in the way, and, if loose, more often than not it is left behind.

When Mr. Chapman became manager to Brin's Co., he introduced a new valve, known as Chapman's Patent Bull-nose. Undoubtedly this gives the greatest protection to the threads and cone, for instead of the male threads, as in all the others, this has a good solid nose, and is threaded internally with a female cone at bottom. The connection is formed similarly to the half-inch, a threaded nipple with a coupling, having a male thread to fit in the nose, and the conoid at end of nipple to make a seat upon the cone. The size of thread in the nose is known as $\frac{5}{8}$in. iron barrel thread, fourteen threads per inch, or $\frac{7}{16}$in. Whitworth bolt, and about $\frac{23}{32}$in. diameter.

This company make the oxy-cylinder with a right-hand thread, and cylinder painted black. The hydrogen has left-hand threads, same size in diameter as the oxygen, but the cylinder is painted red.

Next we have the Manchester cylinders. These vary in external form, but practically are the same as Chapman's, the difference being that the nose, instead of being at the top of cylinder and made in the same casting, is at the side and entirely separate, and forms a loose piece sliding over the valve. This is held in position by a stud, which keeps the screwed part opposite the seating, which is made in the valve fitting. The same fitting made for oxygen cylinders with Brier's and Chapman's valve will also fit these.

The Manchester hydrogen fittings differ from all others. They have right-hand threads of $\frac{5}{8}$in. The fitting of end is the reverse, it being a male conoid upon cylinder, so that the screwed nipple is female.

The Scotch and Irish Company, I believe, still adhere to the half-inch male threads on cylinders—left-hand for hydrogen and right-hand for oxygen cylinders. I venture to say that, with all these improvements, there is no fitting so perfect and simple for making a tight joint as Orchard's male fine thread, although loose cap and linings would appear to be the most perfect theoretically. In practice, I find it quite efficient if a solid casting is used, and, instead of a loose cap, a thin leather washer made from such as boot uppers. You thus get a much stronger fitting for regulators, and it is quite free from solder, which, with the loose cap, must be employed.

Next to this I prefer Chapman's valve, with a moulded leather cone for the nipple conoid to seat upon. This prevents undue wrenching of the connections, and a perfect joint can be made with the force of finger and thumb. It also preserves both cone and conoid, and one has the satisfaction of knowing he has a tight joint. Persons using these must be sure to take them out when sending their cylinders to be filled, as they will be taken out and thrown away.

With all these, one hardly knows which fitting to have when purchasing a regulator, unless he has his own cylinders and never wants to hire, which is rather doubtful.

Beard's patent reversible coupling is very handy, and a regulator fitted with one suits both the $\frac{1}{2}$in. and the

⅝in. cylinders, which are generally supplied by dealers and compressers of gas.

I think if cylinder fittings were made, the oxygen with Bull-nose, but with a flat seating and leather washer, it would be best for all users. The only thing in a leather joint, it is not to be relied upon for any great length of time, as a certain compression necessarily takes place in the leather and so requires tightening up, but, for lantern work, I have found nothing better, the hydrogen cylinder to be male threads as now; no fear of connection being put on the wrong cylinder in this case. I have myself, when taking a right-hand threaded cylinder out and a left-hand regulator been compelled to use it by some means or other, and have succeeded in forcing the connections so as to secure a joint, although the threads have been reverse.

A male thread for one gas cylinder and a female for the other of different sizes would prevent anyone from making an error.

The object of these notes is for making known generally to lanternists what size fittings for cylinders there are in various parts of the country should they be travelling, and think of obtaining the gas from compressers and dealers on their journey, and also to point out that cylinders and fittings have got to about the same state as lenses and their mounts—one conglomeration of sizes and shapes.

How I Became a Lanternist.—IX.

By the Vice-President of the Lantern Society.

(Continued from page 158.)

[CONCLUDING ARTICLE.]

I CONCLUDED in my last by saying that I would relate how I had succeeded in making slides by artificial light, and as I found the work pleasant, fairly quick, extremely successful, simple, and practically within the means of everyone to do just the same, and believing, lastly, it is an obligation on any one man to state his experiences for the benefit of the lantern public, I will try to put in words what I could much better express if I were detailing it to an audience.

I spoke of Griffiths's box without naming it, for that it was to which I alluded. I described it as a shoddy article, but with a grand capacity for good work. I am still convinced that it is a splendid thing. If it could only be made in wood and an improved light-tight door, with drawing out inner slide at the positive end, and with various fittings so as to take a ½, ¼, and 5 x 4, it would be a perfect gem. Of course, the sum charged for the thing, including lens, is so ridiculously small, that it is a marvel of cheapness as it is; but better charge twice the price and have the thing twice as good than have a thing in a somewhat crude condition. Let the box remain the same size and length, but fit a hinged door to work outwards at the back or positive end opening, inside this door let a slide draw up and through the top, and lower down, as in an ordinary dark back, so as to secure the plate from danger.

NEGATIVE END.—Have the sliding frames made to carry ½ plate, 5 x 4, and the thing itself to carry the ½ plate, minus fittings, and each fixture or stick at the end to be of thin metal, so that the focal distance from the lens to the picture should remain identically the same distance, and then a special ground glass should be fitted for each, so that one could slip in any of these sizes at will, together with the glass fitting same. Personally, I had my own temporarily fitted with tin slides, but the ground glass generally procurable is *too dense*. I may also say that ordinary lantern plates are not the best kind to use for night work. A firm I see is advertising in *The Optical Magic Lantern Journal* special rapid plates for reduction. This is certainly a necessity, as will be seen before I finish. Ordinary lantern plates for contact printing, which require from fifteen to sixty seconds' exposure (under S. S. also) are best slow; the others are best fast, I am convinced of it. Makers should supply both rapid and slow for these respective purposes. I also think the boxes should be marked "fast" for reduction, or "slow" for contact.

Finding that no artificial light I had been able to use was effective, I turned on the oxy-hydrogen, taking the lens away from the lantern, then placed the reduction box 5ft. away, and I obtained very good results with from four to seven minutes' exposure. But the trouble of fixing up apparatus, the room it occupied, and other things of that kind, situated as I was, and having to pack it all away every night and refix it for an additional turn many days afterwards, as the case might be, I found rather troublesome. This was clear, however, that by the means of this light and the condenser I got a good picture to a certainty. I also was convinced of the idea that a large condenser covering one's plate was the thing wanted.

The condenser I had made was a six-inch, which covered a 5 x 4, and of course a ¼ plate as well. I had a neat deal frame made to carry it, which stands down at such an elevation as to place the centre of the condenser opposite the centre of the illuminating power of the lamp. The lamp I used was an ordinary 4in. wick paraffin, belonging to my lantern, in which lime-light could be used, as well as oil at will. Having arrived at this stage, there were three or four things to determine. The first was the exposure. That was certainly a serious matter, and the number of plates sacrificed before a proper time was determined upon was very great. But another factor which had to be taken into consideration, in conjunction with the time of exposure, was the increase or decrease of the light, in other words, its strength or weakness, the distance of light from the condenser, and the distance of condenser from the picture.

I ought to have said a good deal about reductions with the camera by this artificial light. I succeeded, and got a number of good pictures with the camera and short focus lens, but the trouble of fixing and focussing the camera, fixing the distance from the condenser, and the distance of light from the condenser, and other things, were matters that required the most minute attention, and were somewhat complex, and though I did enough to convince me that it was possible to do good work with one's camera thus used on a proper appliance, which I had made to carry the light, condenser, and camera, I found the work quite as good and much simpler with Griffiths's box, and therefore I relied on that.

Lamp.—The lamp I first tried had the chimney rather low, a moderate draft, and consequently a moderate light. I found the exposure under these conditions for an ordinary negative to be from twelve to sixteen minutes; the light standing close to the condenser, and the ground-glass and the negative also close to the condenser. I next had the light turned higher, increased the draught by lengthening the chimney, and found that ten minutes' exposure with Mawson's plates was sufficient, but only in one case during several dozen slides thus made have I had one thoroughly over-exposed plate.

I have now settled down to work in the following order: Chimney and lamp full height, flame well up, all power possible; lamp close to the condenser, negative close to condenser, exposure as I say on an average of ten minutes.

Manner of Operating.—I first fix the plate in the box, place the negative in the end of the box, get the whole apparatus in position, start the lamp going, time the start by a watch which I hang near the lamp, doing all this in an outer room. I then retire to the dark room, light up the coloured lamp, effectively darken the room, place the developer, fixing, clearing, all dishes and solution ready for work. By the time this is done I look at my watch in my pocket, which I have put to identically the same time as the aforesaid watch; the time is up, I take the box into the dark room, extract the plate, and put it in a slide box, cover it up, place in another plate, change the negative, carry the apparatus back, and commence another exposure, timing as before, return to dark room and start developing. I find that about a minute brings out the positive, using Hydroquinone (Thomas) mixed ready for use, two solutions equal quantity. I have tried Hintoquinone and others, but for slide work much prefer this. It is not too violent, there is no trouble of regulating its strength, and I have not found it too strong or too weak. I have found with Hintoquinone that unless the lantern plate is developed very quickly there was a slight stain, although with a plate that developed quickly I found Hintoquinone answer. I am not sufficient chemist to know the cause of one result coming instead of another, but there is the fact as I found it. At the end of five minutes my plate is washed, then I immerse it in the fixing solution, wash it well in the same, then rewash under the tap and place in clearing bath. By this time there is only some two or three minutes to wait for the next plate, but generally indeed with one thing or another I found the time fully occupied, and by the time I had completed the developing portion the time was up for extracting the next, and so on. The number of slides made in an hour averaged about five, not more. This may be thought slow work, but I do not see how, taking one thing with another, more could be produced.

Plant Required.—The plant I used was as follows: A small table put out on a large landing, on the top of the table a cork bath mat some 4ft. long—the object of this is to prevent any leakage from the lamp going on the table, and I also found the cork prevented the thing slipping too readily one way or the other—then I placed the lamp and condenser in its carrier, with the box elevated to the right level. This can all be placed in position in five minutes, and put away in the same time.

The objection may be raised that any apparatus for a ½ plate would not take a ¼ plate. I found that it does, and a 5 x 4 too. It is so focussed that the ½ plate makes it cover nearly the whole of the lantern plate, and even the ¼ negative is not too small in proportion. I tried a double-wick paraffin lamp, but failed, even with condenser.

If in these chapters the experiments I have so successfully tried can be found to be of any material help to any brother similarly struggling with the delightful winter pastime of slide making, I shall consider myself repaid.—I now beg, therefore, to sign myself, theirs and your servant, T. H. Holding.

——:o:——

Mr. J. Traill Taylor's Form of Triple Condenser and Fittings.

By T. E. Freshwater.*

This form of condenser consists of two lenses, five inches in diameter and a smaller collecting lens. The principle upon which this condenser is constructed is that the first lens takes up an angle of 95deg. of light from the radiant which is parallelised by the second lens. The third lens cones down this parallel beam so as to fill the focussing lens, and is made removable, so that similar lenses of different foci may be substituted to suit various objectives of long or short focus.

In optical or magic lanterns where large condensers are used to cone the light down through the picture on to the focussing lens, it is obvious that it is advisable to place the picture at such a distance from the condenser so that the whole of the cone of light passes through it, that the utmost illumination may be obtained on the screen. This object is frequently attained by moving the slide forward till it reaches the desired position; but this necessarily puts it out of its right position as regards the front lens, so that it has to be re-focussed, besides which the amount of variation shown on the screen by re-focussing, &c., prevents the operator from ascertaining the effect the movement of the picture has on the illumination.

This was partly remedied afterwards by moving the focussing lens *with* the picture; but this, besides altering the size of the picture on the screen, could only be fitted to the best forms of lanterns at the expense of rigidity, which, though of less importance in a cheap, simple lantern, is fatal in the case of lanterns with heavy lenses of twelve and fourteen inch focus, the fronts of which should be rigidly attached to the condensers, so that the axis of the lenses may be kept optically true.

To obviate these difficulties, the condenser (preferably a triple combination, five inches in diameter) is placed in a solid brass mount fixed to a brass base in grooves on the tray upon which the lime-jet fits. This brass base travels by double racks-and-pinions, or screws on a stout metal bed-plate, to which the front plate of the lantern carrying the picture and focussing lenses is also permanently attached.

By this means we can, after focussing the picture on the screen, move both condenser and jet together away from the slide without affecting the picture on

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[*] London and Provincial Photographic Association.

⅝in. cylinders, which are generally supplied by dealers and compressers of gas.

I think if cylinder fittings were made, the oxygen with Bull-nose, but with a flat seating and leather washer, it would be best for all users. The only thing in a leather joint, it is not to be relied upon for any great length of time, as a certain compression necessarily takes place in the leather and so requires tightening up, but, for lantern work, I have found nothing better, the hydrogen cylinder to be male threads as now; no fear of connection being put on the wrong cylinder in this case. I have myself, when taking a right-hand threaded cylinder out and a left-hand regulator been compelled to use it by some means or other, and have succeeded in forcing the connections so as to secure a joint, although the threads have been reverse.

A male thread for one gas cylinder and a female for the other of different sizes would prevent anyone from making an error.

The object of these notes is for making known generally to lanternists what size fittings for cylinders there are in various parts of the country should they be travelling, and think of obtaining the gas from compressers and dealers on their journey, and also to point out that cylinders and fittings have got to about the same state as lenses and their mounts—one conglomeration of sizes and shapes.

:o:

How I Became a Lanternist.—IX.

By the Vice-President of the Lantern Society.

(Continued from page 158.)

[CONCLUDING ARTICLE.]

I CONCLUDED in my last by saying that I would relate how I had succeeded in making slides by artificial light, and as I found the work pleasant, fairly quick, extremely successful, simple, and practically within the means of everyone to do just the same, and believing, lastly, it is an obligation on any one man to state his experiences for the benefit of the lantern public, I will try to put in words what I could much better express if I were detailing it to an audience.

I spoke of Griffiths's box without naming it, for that it was to which I alluded. I described it as a shoddy article, but with a grand capacity for good work. I am still convinced that it is a splendid thing. If it could only be made in wood and an improved light-tight door, with drawing out inner slide at the positive end, and with various fittings so as to take a ½, ¼, and 5 x 4, it would be a perfect gem. Of course, the sum charged for the thing, including lens, is so ridiculously small, that it is a marvel of cheapness as it is; but better charge twice the price and have the thing twice as good than have a thing in a somewhat crude condition. Let the box remain the same size and length, but fit a hinged door to work outwards at the back or positive end opening, inside this door let a slide draw up and through the top, and lower down, as in an ordinary dark back, so as to secure the plate from danger,

NEGATIVE END.—Have the sliding frames made to carry ¼ plate, 5 x 4, and the thing itself to carry the ½ plate, minus fittings, and each fixture or stick at the end to be of thin metal, so that the focal distance from the lens to the picture should remain identically the same distance, and then a special ground glass should be fitted for each, so that one could slip in any of these sizes at will, together with the glass fitting same. Personally, I had my own temporarily fitted with tin slides, but the ground glass generally procurable is *too dense*. I may also say that ordinary lantern plates are not the best kind to use for night work. A firm I see is advertising in *The Optical Magic Lantern Journal* special rapid plates for reduction. This is certainly a necessity, as will be seen before I finish. Ordinary lantern plates for contact printing, which require from fifteen to sixty seconds' exposure (under S. S. also) are best slow; the others are best fast, I am convinced of it. Makers should supply both ~~rapid~~ and slow for these respective purposes. I also think the boxes should be marked "fast" for reduction, or "slow" for contact.

Finding that no artificial light I had been able to use was effective, I turned on the oxy-hydrogen, taking the lens away from the lantern, then placed the reduction box 5ft. away, and I obtained very good results with from four to seven minutes' exposure. But the trouble of fixing up apparatus, the room it occupied, and other things of that kind, situated as I was, and having to pack it all away every night and refix it for an additional turn many days afterwards, as the case might be, I found rather troublesome. This was clear, however, that by the means of this light and the condenser I got a good picture to a certainty. I also was convinced of the idea that a large condenser covering one's plate was the thing wanted.

The condenser I had made was a six-inch, which covered a 5 x 4, and of course a ¼ plate as well. I had a neat deal frame made to carry it, which stands down at such an elevation as to place the centre of the condenser opposite the centre of the illuminating power of the lamp. The lamp I used was an ordinary 4in. wick paraffin, belonging to my lantern, in which limelight could be used, as well as oil at will. Having arrived at this stage, there were three or four things to determine. The first was the exposure. That was certainly a serious matter, and the number of plates sacrificed before a proper time was determined upon was very great. But another factor which had to be taken into consideration, in conjunction with the time of exposure, was the increase or decrease of the light, in other words, its strength or weakness, the distance of light from the condenser, and the distance of condenser from the picture.

I ought to have said a good deal about reductions with the camera by this artificial light. I succeeded, and got a number of good pictures with the camera and short focus lens, but the trouble of fixing and focussing the camera, fixing the distance from the condenser, and the distance of light from the condenser, and other things, were matters that required the most minute attention, and were somewhat complex, and though I did enough to convince me that it was possible to do good work with one's camera thus used on a proper appliance, which I had made to carry the light, condenser, and camera, I found the work quite as good and much simpler with Griffiths's box, and therefore I relied on that.

LAMP.—The lamp I first tried had the chimney rather low, a moderate draft, and consequently a moderate light. I found the exposure under these conditions for an ordinary negative to be from twelve to sixteen minutes; the light standing close to the condenser, and the ground-glass and the negative also close to the condenser. I next had the light turned higher, increased the draught by lengthening the chimney, and found that ten minutes' exposure with Mawson's plates was sufficient, but only in one case during several dozen slides thus made have I had one thoroughly over-exposed plate.

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MANNER OF OPERATING.—I first fix the plate in the box, place the negative in the end of the box, get the whole apparatus in position, start the lamp going, time the start by a watch which I hang near the lamp, doing all this in an outer room. I then retire to the dark room, light up the coloured lamp, effectively darken the room, place the developer, fixing, clearing, all dishes and solution ready for work. By the time this is done I look at my watch in my pocket, which I have put to identically the same time as the aforesaid watch; the time is up, I take the box into the dark room, extract the plate, and put it in a slide box, cover it up, place in another plate, change the negative, carry the apparatus back, and commence another exposure, timing as before, return to dark room and start developing. I find that about a minute brings out the positive, using Hydroquinone (Thomas) mixed ready for use, two solutions equal quantity. I have tried Hintoquinone and others, but for slide work much prefer this. It is not too violent, there is no trouble of regulating its strength, and I have not found it too strong or too weak. I have found with Hintoquinone that unless the lantern plate is developed very quickly there was a slight stain, although with a plate that developed quickly I found Hintoquinone answer. I am not sufficient chemist to know the cause of one result coming instead of another, but there is the fact as I found it. At the end of five minutes my plate is washed, then I immerse it in the fixing solution, wash it well in the same, then rewash under the tap and place in clearing bath. By this time there is only some two or three minutes to wait for the next plate, but generally indeed with one thing or another I found the time fully occupied, and by the time I had completed the developing portion the time was up for extracting the next, and so on. The number of slides made in an hour averaged about five, not more. This may be thought slow work, but I do not see how, taking one thing with another, more could be produced.

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—:o:—

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To obviate these difficulties, the condenser (preferably a triple combination, five inches in diameter) is placed in a solid brass mount fixed to a brass base in grooves on the tray upon which the lime-jet fits. This brass base travels by double racks-and-pinions, or screws on a stout metal bed-plate, to which the front plate of the lantern carrying the picture and focussing lenses is also permanently attached.

By this means we can, after focussing the picture on the screen, move both condenser and jet together away from the slide without affecting the picture on the screen in any way except by increase or decrease of illumination, and so can adjust the relative positions of the cone and the picture without difficulty.

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* London and Provincial Photographic Association.

Should slides of various shapes and sizes require to be exhibited in succession, the condenser and jet may, if desired, be racked backwards or forwards to suit any one of them without altering any of the other adjustments, and without moving or affecting the picture on the screen in any way, except by increasing its brilliancy.

The lantern front, being fixed to the bed-plate, is perfectly rigid, and if it requires tilting up or down to make the disc coincide with other discs on the screen, this may be done in the usual way, without in any way affecting the optic axis, as the jet, condenser, slide, and front lens all move together.

The tray carrying the jet is preferably fitted with rack motions, and made to slide into grooves on the travelling base of the lantern, so that, though it can be moved, together with the condenser, by means of the rack already described, it can also be moved independently to and from the condenser, above and below, and to right and left of the optic axis, so that it may be readily centred.

:o:

"Notes" on "Queries."

By the Old 'Un.

In the November issue there is a reply to "Ed. Summers" on the deterioration of oxygen in a gas-bag, which suggests that such is caused by the naphtha vapour from the india-rubber solution, always present in a new bag. But it is well known that in all bags, new or old oxygen and hydrogen will deteriorate very rapidly, a few days being often sufficient to make oxygen comparatively worthless, and hydrogen in time becoming explosive by simple dilution with the atmosphere. The cause is to be found in the well-known osmotic action of gases or fluids enclosed in a membrane, the gas inside changing places with the air outside, in spite of the apparently gas-proof bag which intervenes. Gas-bags should never be filled more than twenty-four hours before use, and as much less as possible if the gas is to do its best.

Another correspondent ("De Mendlie Hall") has a suggestion of using two or three jets to play upon one lime surface to increase the light. It will probably interest him to know that this has been tried in almost every way in connection with theatrical illumination, but has not proved to be a success. If the jets play upon nearly the same point the flames interfere with each other, and do not give the increased light which might be expected. If they are separated so as to give each jet a chance, the points of light are as distinct as though each were a separate piece of lime, without so good a result as to body of light as separate limes would give. I am afraid, therefore, the idea, which it will be seen is not new, will not be found worth the trouble and expense involved in carrying it out.

The correspondent "Gourdnam," who seems to wish to drop his oxygen-cylinder from the top of a house, may be comforted by the information that the actual experiment has been tried by the Manchester Oxygen Company, who, in reference to the explosions of a few years ago, subjected a number of charged cylinders to a series of most extraordinary tests, which only resulted in denting and defacing the cylinders. They would not explode, and they would not even leak, and the pressure at the close was found to be undisturbed by the rough treatment which had been given. At the same time, regard for one's own property, and the property of others, would suggest that gas-cylinders, with their soft gun-metal valves and screws, should always be treated with care, and not be used as handy weights, either to break coals, or ram stones with, although both purposes might be served without much risk of danger.

:o:

The Eth-oxo Light.

By Alfred Lomax.

The safety and practical utility of the above-named light is much questioned. Its proved advantages appear to be—so far as the general public is concerned—its splendid brilliancy and tempting convenience.

The only apparent drawback is the unrest and doubt concerning its safety in use. Some say there is actual danger in its use; others, that though there is no danger in itself, it is a source of danger from its liability to be the cause of panics in audiences.

In my own opinion, the light is quite safe in use, but at the same time it is requisite that those who use this form of light should first comprehend the principles which regulate its working. It is an easy matter to render things that are most harmless in themselves hurtful from improper use.

Use a saturator that may be warmed, for the colder the conditions are, the less saturating power the ether possesses, and as one cause of explosion is in consequence of the oxygen not taking up a sufficient amount of ether, the necessity of warmth as an aid becomes apparent. Of course it causes a little trouble, which is not a bad thing, for the less we have to do the less we feel inclined to do.

Always allow plenty of time for the liquid to thoroughly saturate before draining, and do not use the saturator for too long a time ere re-saturating. When such a condition as the latter is allowed, the amount of vapour is greatly lessened and the oxygen cannot obtain a sufficient supply and the character of the light is now stronger, and it will be found that the one current of ether vapour will give a light of great brilliance, without the aid of the pure oxygen current. In such conditions the gas is explosive.

The bore of the jet should be very small. Do not turn oxygen tap off first; let the flame be out ere you check the flow of gas, otherwise you will give it a practical invitation to pass backwards.

Use safety valves, not from fear but from prudence. When explosions take place it is in the jet chamber—I had almost said explosion chamber. It is not far from the orifice of the jet to this chamber, hence the more reason for care. In case of explosion, however, the valves will save your saturator from firing, which will also save your pocket.

Will a saturator explode if a flame reaches it? Well. I will relate a personal experience. While exhibiting in a large hall situated in a large town, one of the popularly-named "pops" occurred at the conclusion of the lecture. The light passed backwards, and, through working without safety valves, the tank immediately fired. At first the flame found passage through the outlets of the saturator, but soon asserted its power in burning and melting the barrels of the saturator, mounting two or three feet high into the air. In a short time, however, it died away and went out. There was not the slightest noise; merely a bonfire, and that was the end of it.

I think the reader will agree that the above was a practical test of the explodibility of the ordinary saturator. The accident did me good; its kindness was rough but genuine. I am wiser now—for I have ever made use of accidents, when they did occur, and difficulty to increase my knowledge—though it is no excuse for me using the saturator without properly knowing how to use it. Scientific theory is well and valuable, but not enough.

I still hold that saturators are in every way safe, when carefully used. Pops can always be traced to carelessness, want of knowledge, or inadaptable apparatus. The nautical couplet might here be well applied :—

"Both in safety and in doubt
Always keep a good look-out."

:o:

Stereoscopic Effects with the Lantern.

BY GEO. H. SLIGHT.

I HAVE felt somewhat disappointed with Mr. Teale's elaborate article on "Stereoscopic Effects with the Optical Lantern," for, while it contains a number of truths, it also contains a number of vague if not mistaken ideas, while the particular subject of the essay seems to be as much out of reach as ever.

The way in which he explains stereoscopic relief is especially indefinite : thus "these double pictures are assimilated or registered by the natural functions of the eyes, the result of a combined physical and mental effort, cultivated, it is claimed, during infancy." This may perhaps be true, but the perception of stereoscopic relief is so purely mechanical, that it surely does not require to be hidden behind a lot of vague generalisms.

The fact is, that when we look at natural objects with both eyes, we do not require any special training, or to trouble our heads, or eyes, about thinking we are looking at two images, but we first of all direct our eyes to one point and we see it distinctly as one point, the two images forming one. Every other part of the object that may be indistinctly seen—except those the same distance from the eyes, is doubled, but the eyes at that instant are, so to speak, oblivious to this doubling.

When the eyes are allowed to wander to another point, it is then seen as one, and the first point, if seen at all, is probably doubled, and so on over the whole scene.

Perhaps the most wonderful thing in connection with this wandering of the eyes over the successive points in the view, is the, in one sense. unconscious alteration which takes place in the visual angle, or the angle formed by the axes of the eyes. When a distant object is seen, the axes are parallel, or form a very small angle, but when an object is near, and the eyes are directed to it, the axes must converge and form a larger angle; and there is no doubt that this alteration in the visual angle gives us a measure of the relative distance of different objects, and we feel, as it were, that as the angle increases or diminishes, so is the object near or distant. In the stereoscope, again, the objects being represented exactly as they appear to our two eyes, the various points combine, one at a time, as they did when we saw the actual objects ; and as the distant objects, in the two pictures, are farther apart on the slide than nearer ones, there is necessarily the same continual alteration of the visual angle as there was in looking at the actual objects, and precisely the same idea of distance or solidity.

In adapting the lantern to stereoscopic vision, Mr. Teale appears to recommend that the two pictures should be super-imposed and looked at from one particular point of view; but such pictures vary so much that, even with the most correct registering, they could not possibly coincide, except in a few points which might happen to be on the same plane, or at the same distance from the cameras in the original; and as other points, on different planes, would be doubled, the eyes, however much they were strained, could not possibly see them as single, because there would still remain for each eye the less distinct duplicate point belonging to the second picture, and nothing but confusion could be the result.

It may, therefore, be held as impracticable to give stereoscopic relief by means of super-imposed pictures equally illuminated. The method of doing it by differently-coloured pictures is another question altogether, which at best can only be approximately satisfactory.

Without proper trial it is, perhaps, unsafe to speak with anything like certainty, but from experiments made with ordinary stereoscopic slides, I am inclined to think that the particular point from which a stereoscopic picture is seen, is not of such great consequence as Mr. Teale alleges, and that, although correct perspective may be sacrificed by oblique vision, stereoscopic relief may be possible at a considerable angle from the correct centre line. I would, therefore, suggest the very prosaic way of exhibiting lantern stereoscopic pictures exactly as in a common stereoscope—that is showing them side by side, by means of two lanterns placed as far apart as the centres of the screens or discs, and let the spectators look at them, each through his own pair of non-magnifying prisms, in order to combine them as in a stereoscope. If such prisms could be made adjustable, so that they might receive the rays of light from the screen at different angles of convergence, they could be readily used at various distances from the screen.

It goes almost without saying, that the best position from which to see such pictures would be directly in front of them, and as far off as distinct vision would allow; but I believe that they could be fairly well seen from a considerable distance on either side; and at different distances in front, while, in the very worst positions, where only one of the two pictures could be correctly seen, it would be as satisfactory as looking at an ordinary single-lantern picture.

Hints and Helps.—No. 4.

By C. E. Rendle.

CHRISTMASTIDE REMINISCENCES.

"I love to sit with the children
Around the Christmas fire,
And tell them fairy legends,
Of which we never tire.
When the snow has fallen and drifted,
When hips and haws are ripe,
I draw my chair close to the hearth,
And so enjoy my pipe."
The Gardener's Song of the Seasons.

By digressing somewhat from my subject, the Editor will no doubt pardon me when he considers the approaching season, the season when all lanternists should (so to speak) be up to their ears in business. The flood-gates of that mysterious something, known as Christmas literature, have been thrown wide open; the shop windows are teeming with pictures of all sizes and colours. Christmas Cards are in abundance—some pretty, others novel, and some so beautiful, that one is at a loss to know where the ideas emanate from. The historical associations of the twenty-fifth are too familiar to dwell upon. It has been called the children's boon - a fact we will endorse in its entirety, for although, as the years advance, we are apt to get tired of the repeated excitement, the youngster will ever be charmed (so long as their ignorance lasts) with the yearly visits of their old, dear old friend, "Santa Claus," who creeps so successfully down everybody's chimney, leaving some traces behind him that he was not unmindful of their recent good behaviour. The huge collection this strange old personage carries with him is beyond comprehension, from a bon-bon to an elephant:

"There are balls, books, and horses,
All pleasing to see,
And birds of all colours are perched on the tree;
While Santa Claus laughing
Stands out at the top,
As if getting ready more presents to drop."

The first lantern experience I can remember dates from the Christmas evening of 1860. I was a boy at school. I think it wise to mention this that I may not be considered older than I really am. It was a severe winter. The ponds frozen over at the foot of the meadow, where we skated all Christmas morning. The fields were covered with snow; our little cottage, in the north of England, enveloped by hoar-frost. Uncle Bob had brought us about a month previously, a book of a real pantomime, and promised to paint some pictures to illustrate the dialogue with his magic lantern, if we would undertake to study the parts. That was enough. There were my brothers and sisters, and one or two other brothers and sisters, assembled next evening to hear mother read "Valentine and Orson; or, the Wild Man and the Gorilla," after which the parts would be chosen. Bridget, my eldest sister, was the selected Valentine, while the narrator was to be the Orson. Uncle Bob generously volunteered to be cast for the Gorilla, who really had nothing to say, the speciality of the part being to groan in the right place. The rehearsals were enthusiastic. Mother worked very hard as general tutor, musical director, and so on, while the scenic artist was getting on as quickly with his painted slides as he could wish. There were a dozen pictures in all for this lengthy exhibition. Remember we had not the facilities for making a selection from a catalogue such as you see to-day, but glad to get *what* we could. The evening came; the lantern set up; the sheet across the kitchen; exhibitor and performers on one side, the invited guests on the other. I've thought since the anticipation was greater than the realization, for Uncle Bob was in difficulties before the first item was closed—the lamp went out; the colza was bad. The band had to play while the fault was put right. After that, however, things improved; everything went well, and success was our reward. How we shouted with delight; we could not speak our lines for laughing; the part-singing was impeded with an occasional ripple; and Uncle Bob could not groan for the hilarity underneath his waistcoat. Imagine, if you can, a hand-painted slide about a foot square, the principal characters in which were movable; the scene—a rocky mountain; Valentine's visit to Orson's home; the Gorilla (Orson's mother), dancing around, while her son describes, in pathetic language, something about his infancy. Take a verse :—

Air: "The Power of Love."

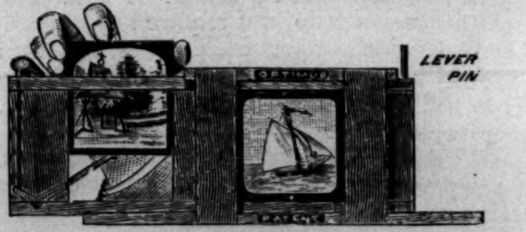
Orson: "This, my mother dear! which I so much adore,
My infancy did rear, upon this rocky floor,
Taught me first to steal, and take what wasn't mine:
Mutton, pork, and veal for us both to dine.
Don't I love my mother."
Gorilla: "Growls."
Orson: "This, my only mother."
Gorilla: "Growls and howls. . . . ."

But it gave pleasure to us youngsters; and much can be done in this way by any of us possessing a lantern, however crude it may be. I should look to-day upon Uncle Bob's with suspicion; but why should I? He did his best; the best of us can do no more. Let Christmas night be for the children's show; they will never forget it; you will never regret it.

——:o:——

Editorial Table.

Lantern Carrier.—We have received from Messrs. Perken, Son, and Rayment, a new form of carrier which by pressure on a pin causes the lantern slide to rise up into the hand. The engraving will at once show its principle.



Lecturer's Reading Lamp and Desk.—A short time ago, Mr. W. I. Chadwick sent us a parcel of small dimensions, which on being unpacked and the contents unfolded and set up, proved to be a complete desk, light, and stand for a lecturer. By grasping one end of a small stand and liberating a catch the legs of the stand fell into position, next a Russian iron lantern (which also acts as a box for fifty slides) was set] upon a square head at the end of stand, a shade was then hinged back from this box, a flap, hinged into three, was opened up and hooked on to the lantern, the brass rod which carries a curtain was passed through two holes, and we had a desk and lamp which we value highly. The curtain which hangs to the ground gives the whole thing a substantial appearance.

Wray's Catalogue of photographic lenses is to hand. We observe that this firm (North Hill, Highgate, N.) is making a special feature of iris diaphragms, aluminium settings, casket lenses, and of lenses for hand cameras. These latter have a particularly neat appearance, are made of Jena glass, and are provided with either iris diaphragm or Waterhouse stops; the full opening of these lenses is F8, at which aperture they define with great sharpness. Numerous styles of lenses are shown and described, and at the end of the catalogue is a table giving the angle subtended by any lens on the ordinary sizes of plates.

New Effect Slide.—Mr. Underhill, of Croydon, has produced a set of Sandringham Hall, showing it by day, moonlight, and winter with snow effect, and also the hall on fire (Nov. 1, 1891).

"**Photography in a Nutshell**" has reached its fourth edition, and has been enlarged and to an extent rewritten, consequently it will be found more interesting than ever. The book is published in the interests of Mr. Wm. Tylar, of Birmingham, who devotes about four dozen pages at the end to a description of the numerous goods in which he deals. The price of the book is one shilling.

Tales without Words.—Five books of humorous sketches have been received from Messrs. Morison Brothers, 99, Buchanan-street, Glasgow. They include "A Fishing Adventure," "A Bicycling Adventure," "A Shooting Adventure," "A Boating Adventure," and "The Ubiquitous and his Portable Dark Tent." These will be found admirable subjects for reproducing as lantern slides, and will keep the juvenile portion of an audience (and for that matter the adults as well) in roars of laughter. These humorous books of sketches may be obtained at sixpence each.

Slides.—A humorous coloured set, illustrating "How Bill Adams won the Battle of Waterloo," is now being issued by Messrs. Levi and Co., London, who supply wholesale only. This set, with the accompanying story, will be found to be most laughable, and is specially brought out for the juveniles.

Designs.—From particulars and prices obtained from the catalogue of Mr. F. Weeks, 21, Thorpe-road, Forest Gate, E. We observe that designs for slides can be executed from five shillings. The set of slides entitled, Temperance Picture Gallery, issued by the Band of Hope Union, have been made from Mr. Weeks's designs.

Correspondence.

RE CLICK IN BEARD'S REGULATOR.

[*To the Editor.*]

Sir,—The noise is undoubtedly caused by the coils of the spring not clearing each other properly in compression, and therefore cause the click in passing each other. Or the regulator perhaps requires readjusting. If "L. P. D." takes cover off, and holds his finger over outlet, and turns gas into regulator, he will see the height the bellows expands to; by holding the cover alongside he will see if the expanded bellows equals the height of cover, if so, it requires adjusting.—Yours, &c., R. R. Beard.

62, Alscot-road, Bermondsey, S.E.

LANTERN MICROSCOPE.

[*To the Editor.*]

Sir,—Kindly permit me to say a few words in correction of Mr. Chadwick's paper on "Leach's Lantern Microscope," reported in the issue of November. That Mr. C. is considered a great authority on photography and the management of the lantern every one fully admits, but judging from his remarks on the lantern microscope, he has not ventured very far in the microscopic world. As one who constructed and worked the lantern microscope several years before even Mr. Leach, I think I am able to judge what such an instrument will do. In the first place, Mr. C. is against every authority regarding magnification. Extreme magnification, such as Mr. C. suggests, is condemned by every authority of note, both for the microscope and the lantern microscope. That the magnification which enables the observer to see *all* the details of an object is the largest to which it should be subjected, anything beyond this defeating the purpose. Mr. C. says that with his arrangement high powers can be used for class and other demonstrations, although he has previously stated that the arrangement of condensers is only adapted for objectives of four-tenths of an inch, which is by no means a high power. Mr. C. cannot surely be ignorant of the facts that lantern microscopes, of whatever make, have long been discarded by the college authorities where high powers are required. I see, too, that he has come round to my views, and does not recommend the use of special objectives.

His last paragraph but two is a contradiction of the previous portion of his paper, where he leads us to suppose that he can use high powers; that is, of course, one-fifteenth or one-twentieth of an inch objective with his arrangement, simply because he uses an alum trough. What he says is simply this, in order to use a high power requiring a large amount of light, interpose an alum trough, which stops 50 per cent. of the light! Mr. Chadwick does not seem to be aware of the fact that it is possible to focus the heat rays at a point beyond the luminous rays, and thus avoid all heating of the slide.

I should like to inform Mr. Chadwick that the substage condenser, of which he speaks, and the way of interchanging the objectives, was used by me more than sixteen years ago, and shown to Mr. Leach in 1876.

In conclusion, Mr. Chadwick says that lantern microscopes, which have no alum trough, are self-condemned. This I deny. I do not use an alum trough, and have never melted a slide.—Yours truly, J. A. Furnivel.

Manchester.

ROLLING CURTAIN SHUTTER.

[*To the Editor.*]

Sir,—In the concluding paragraph of an article in last month's *Optical Magic Latern Journal*, the writer (Mr. G. S. Thompson) says, "That as I do not know of any other shutter combining these advantages, I have patented my idea." As it may interest him and your readers, I now append some particulars of shutters I have constructed.

I first adapted a supplemental slide to the curtain shutter of a triple lantern I built for Mr. Edward J. Smith, of Halifax, in 1887. This, I believe, was the *first* that permitted the curtain shutter *to remain always in the lantern* of either bi-unial or triple form, and allowed either two or three stages, as the case may be, to be used, *and also* provided for the perfect adjustment of the dividing line between the rolling up picture (of curtain, view, &c.) and the one being revealed. This was effected by a milled head screw from the top shoulder of the supplemental slide of shutter, which also obviates the removal of the shutter from the lantern, and facilitates an *exact* amount of adjustment.

I see by a letter sent me on 12th May, 1888, Mr. Smith says, "The special *double* curtain shutter you fitted to my new lantern last autumn has been much admired by both professionals and amateurs as a great improvement on the usual arrangement."

When I constructed Sir David Solomon's latest pattern large triple lantern, "The Premier," in August, 1890, I fitted a special curtain shutter, by means of which any two of the three stages could be used at will for rolling up effects, or the whole three exposed without removing any portion of the shutter from the lantern. The adjustment for dark line was also arranged for. In those described by Mr. Thompson, no provision seems to be made for adjusting the distance between opening and bottom of curtain shutter, hence the separating line of curtain and view on the screen may be much too broad and black, or white, according to the angle of the fronts and the focus of the objective.—Yours, &c., J. H. STEWARD.

406, Strand, London.

—:o:—

Notes and Queries.

Ch. Rice asks how he can render his lantern screen, which is made of calico, fireproof? *Answer.*—Soak it either in a saturated solution of alum, or tungstate of soda.

B. R. writes: "I hear that glass-lined tubing is now an article of commerce. Would this not be better for lantern connections than indiarubber, which causes gas, ether, &c., to deteriorate?" No; the fact of it being unbendable is against it.

J. C. Oliphant writes: "I saw it stated lately, by a speaker at a photographic society meeting, that there was a great advantage in using special colourless French glass for lantern slides, and that this is very largely done in America. Are such lantern plates to be obtained in this country?" *Answer.*—We have communicated with several makers respecting this query. The Britannia Works Company say that they do not coat this glass, as its cost would not find customers, and that the specially thin glass they use is sufficiently colourless for all practical purposes. *Messrs. R. Mawson and Swan* say they avoid French and Belgian glass, because of the inferior quality, but if there is any likelihood of a demand for a quantity, they would be prepared to coat it at the risk of the purchaser, that is, he must be prepared to pay for and accept all imperfections. *Messrs. B. J. Edwards and Co.* say that their lantern plates are coated on thin glass, so nearly colourless that even in micro-photography no colour is discernible. *The Fry Manufacturing Company* state that they keep lantern plates on French colourless glass for special customers, price 18s. a gross. Up to the time of going to press we had had no reply from Messrs. R. W. Thomas and Co. (Limited).

F. Weeks writes: "In 'Hints and Helps,' No. 3, C. E. R. mentions pivot holes getting too large, and suggests a remedy, but a much quicker and simpler way to obviate this, is to get a small piece (to size required) of thin sheet brass, bend into shell of a ferrule, and insert into pivot-hole of wheel."

R. G. W.—We replied per post.

W. Vicarey.—Thanks for particulars sent, also for your good wishes.

E. Andrews.—You will have received our reply ere this.

Archer and Son.—Package post arrived as we were going to press; consequently no time to try, and report in this issue.

John W. Spencer.—We do not know where the plates mentioned can be obtained, and would think that developing up would be preferable.

W. E. T. writes: "(1) Can you tell me if the hole in nipple of a mixed gas jet should be larger when using two cylinders than for bags, if so would it stop the roaring and give a better light? (2) Would the light be improved by passing the gases through a brass wire gauze placed in the chamber of jet." *Reply.*—(1) No. (2) Opinions are divided on this point, some holding the opinion that fine gauze is beneficial, whilst others dispense with it and find that the gasses mix readily without.

Bristol writes: "Is any ill effect, accident or explosion, likely to happen if I connect a steel cylinder, just charged with 40ft. of oxygen up to a cylinder which has been used down to 5ft., and allow as much as will pass from the full one into the nearly empty one? How many times may I do this with safety, without sending *the one* to be re-filled?" *Answer.*—There is no danger in connecting cylinders in the way you mention, but the number of times the one cylinder may be charged from the others depends, of course, upon its size. Practically, if a large and small cylinder are thus connected, and the valves opened for a few moments, upon testing each with a gauge, the large one will show greater pressure than the small.

J. Bennett.—If you consult the index in this issue, you will find a number of articles, both for and against ether saturators. The one you name is said to be quite safe, but as you speak of yourself as "a rather nervous person," who wishes to try lime-light instead of oil, we would recommend the blow-through jet.

S. John Sutton (Darabe).—We will send you an illustration of a lantern which has a moveable fitting for condenser, so that you can insert a large size for the purpose you name, or a smaller for ordinary lantern purposes.

H. M. Houghton.—It is more than probable that the bags when partly empty were re-filled with the wrong gasses.

Mrs. H. M. Scattergood.—You have our sympathy in your trouble. Shall be pleased to hear from your husband when he is again able to write.

Hampton, Judd and Co.—Received just as we were going to press.

Bull's-Eye.—"Flashes" came too late for this issue.

G. Y. L. E.—Yes, it is good.

B. J. Malden.—Thanks; but received too late for this issue.

—:o:—

WE have been reluctantly compelled to omit several interesting Society Reports from this issue for want of space.